

obviated. Moreover, applicants would like to thank Examiner Prouty for her suggestions for overcoming this informality.

Claims 18 and 20-22 were rejected under 35 USC 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection is respectfully traversed.

The Official Action alleged that claims 21 and 22 were unclear due to the term "food grade vehicle". The Official Action believed that this term was indefinite. However, applicants respectfully submit that one of ordinary skill in the art would find the term "food grade vehicle" definite. Indeed, applicants submit that the definitions provided by the Official Action for claims 21 and 22 are proper. It is believed that the term is definite to one of ordinary skill in the art.

The outstanding Official Action further rejected claim 22 as being indefinite for reciting the term "symbiotic". Applicants have amended claim 22 to delete this term and insert the term "synbiotic". The term "synbiotic" does not mean capable of growth. The term means having both "probiotic" and "prebiotic" properties. In particular, the term refers to a combination of probiotic microorganisms and prebiotic substrates (see present specification, page 9, lines 8-10). Thus, it is believed that claim 22 is definite to one of ordinary skill in the art.

In view of the above, it is believed to be apparent that pending claims 15 and 17-24 are definite to one of ordinary skill in the art.

In the outstanding Official Action, claims 15 and 18-23 were rejected under 35 USC 112, first paragraph, for allegedly being based on an insufficient written description. It is believed that the present amendment obviates this rejection.

Applicants note that claim 16 was found by the Examiner to satisfy the written description requirement. Claim 16 was directed to a protein exhibiting 75% amino acid identity with the amino acid sequence No. 1 or 11. Independent claim 15 has been amended to recite that the protein exhibits 75% amino acid identity, as determined by a BLAST algorithm, with the amino acid sequence of SEQ ID NO:1 or 11.

Moreover, independent claims 23 and 24 recite that the claimed protein exhibits at least 85% amino acid identity. As a result, it is believed to be apparent that the specification sufficiently describes the claimed invention in such full, clear, concise, and exact terms so that one of ordinary skill in the art would recognize that applicants were in possession of the claimed invention.

In the outstanding Official Action, claims 15, 16, and 18-23 were rejected under 35 USC 112, first paragraph, for allegedly being based on a non-enabling disclosure. This rejection is respectfully traversed.

The outstanding Official Action alleged that while the present disclosure was enabling for methods utilizing fructosyltransferases having at least 85% amino acid sequence identity to SEQ ID NOS:1 or 11, the specification does not enable claims directed to methods of using any fructosyltransferases comprising 15 amino acids of SEQ ID NOS:1 or 11.

As noted above, claims 23 and 24 have been amended to recite that the fructosyltransferases exhibit 85% amino identity to SEQ ID NOS: 1 or 11. Thus, independent claims 23 and 24 are not directed to methods of using fructosyltransferases comprising 15 amino acids. It is believed to be apparent that these claims are supported by an enabling disclosure.

Claim 15 recites that the fructosyltransferases exhibit 75% amino acid identity to SEQ ID NOS:1 or 11. Applicants respectfully submit that it is well understood by one skilled in the art that particular portions of an enzyme can be exchanged by more or less similar amino acid sequences, without changing the activity of the enzyme. Moreover, the specification provides guiding information on the importance of specific amino acids and sub-sequences to be used for isolating similar, but not identical forms of the enzymes from other sources (see present specification, pages 4 to 6; and Example 1).

Thus, applicants believe that the present disclosure is enabling for claims 15-22. Moreover, the Examiner is respectfully reminded that the test of enablement is not whether

any experimentation is necessary, but whether, if experimentation is necessary, it is undue. *In re Angstadt*, 537 F.2d 498, 504, 190 USPQ 214, 219 (CCPA 1976). In fact, a disclosure is enabling even if a considerable amount of experimentation is involved so long as the experimentation is merely routine and not unduly extensive. The presently claimed invention is directed to a process for producing a fructo-oligosaccharide or fructopolysaccharide. The protein encompassed by the claimed method is identified by its fructosyltransferase activity and level of amino acid identity by percentage. Applicants respectfully submit that the claimed invention is enabled by the present disclosure.

In the outstanding Official Action, claims 15-20 and 23 were rejected under 35 USC 102(b) as allegedly being anticipated by VAN GEEL-SCHUTTEN et al. (1999) or VAN GEEL-SCHUTTEN et al. (1998). Claims 21 and 22 were rejected under 35 USC 102(a) as allegedly being obvious in view of the VAN GEEL-SCHUTTEN et al. (1999) or VAN GEEL-SCHUTTEN et al. (1998). These rejections are respectfully traversed.

As to the VAN GEEL-SCHUTTEN et al. publications, applicants believe that these publications fail to disclose or suggest the claimed invention.

It is believed that the VAN GEEL-SCHUTTEN et al. (1999) publication fails to disclose or suggest the nature and number of enzymes involved in the study. In fact, on page 3013 of the

publication, the authors state that further research needs to be done to fully characterize and identify the enzymes. As a result, applicants believe that the publication does not anticipate or inherently disclose the claimed invention. Absent the nature and identity of the enzymes being characterized, it is believed that the publication fails to qualify as an enabling or anticipatory reference.

As to the VAN GEEL-SCHUTTEN et al. (1998) publication, this publication describes screening of *Lactobacillus* strains for the production of extra-cellular polysaccharides (EPS). The publication discusses that *Lactobacillus* strain LB121 can produce a glucan and a fructan. The *Lactobacilli* were cultured in a growth supporting medium (NRS), to which sucrose or other sugars were supplemented. The publication does not disclose or suggest ways for producing the EPS, nor does the publication describe the nature of the EPS, nor the nature or the isolation of the enzyme or enzymes responsible for the production of a fructan.

According to the present invention, it was found that at least two different fructans can be produced using particular enzymes from *lactobacilli*, and that one is responsible for the production of each of one of the fructans (two enzymes being capable of producing two fructans). Neither of the modes of producing fructo-oligosaccharides or fructo-polysaccharides as set forth in the claimed invention are taught by the publication. The publication fails to disclose or suggest combining the protein with sucrose. Moreover, one of ordinary skill in the art cannot expect on the basis of the VAN GEEL-SCHUTTEN (1998)

publication that *lactobacillus* strains could produce fructans by just combining them with sucrose (by using them as the enzyme carrier and not under standard growth conditions). Therefore, it is believed that the publication fails to disclose or suggest the claimed invention.

In view of the present amendment and the foregoing remarks, therefore, it is believed that this application is now in condition for allowance, with claims 15 and 17-24, as presented. Allowance and passage to issue on that basis are accordingly respectfully requested.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

Respectfully submitted,

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

Claim 15 has been amended as follows:

15. (amended) A process of producing a fructo-oligosaccharide or fructo-polysaccharide, having  $\beta(2-1)$  linked D-fructosyl units or having  $\beta(2-6)$  linked D-fructosyl units comprising forming a mixture by combining sucrose with at least one reaction partner selected from the group consisting of:

a) a protein having fructosyltransferase activity, which exhibits at least [65%] 75% amino acid identity, as determined by a BLAST algorithm, with an amino acid sequence of SEQ ID No. 1 or 11, [or a part thereof having at least 15 contiguous amino acids which are identical to the corresponding part of the amino acid sequence of SEQ ID No. 1 or 11,]

b) a recombinant host cell containing one or more copies of a nucleic acid construct gene encoding for said protein (a) and capable of expressing said protein; and

c) a *Lactobacillus* strain expressing protein (a) having fructosyltransferase activity,

wherein said reaction partner interacts with sucrose to produce a fructo-oligosaccharide or fructo-polysaccharide.

Claim 18 has been amended as follows:

18. (amended) The process according to claim 15,

wherein said protein produces [an inulin having] a fructan and/or fructo-oligosaccharide  $\beta(2-1)$  linked D-fructosyl units and/or [a levan] a fructan and/or fructo-oligosaccharide having  $\beta(2-6)$  linked D-fructosyl units [and/or fructo-oligosaccharides].

Claim 20 has been amended as follows:

20. (amended) A process according to claim 16, further comprising chemically modifying said oligosaccharide or polysaccharide by [3,4-oxidation,] simultaneous 3- and 4-oxidation, by 1-or 6-oxidation, phosphorylation, acylation, [alkylation,] hydroxyalkylation, carboxymethylation, amino-alkylation of one or more anhydrofructose units [of a fructan containing a degree of polymerization of at least 100 units], or by hydrolysis.

Claim 22 has been amended as follows:

22. (amended) The process according to claim 15, further comprising adding to said mixture a *Lactobacillus* strain capable of producing an oligosaccharide or polysaccharide and optionally a food-grade vehicle, to obtain a [symbiotic] synbiotic composition.

Claim 23 has been amended as follows:

23. (amended) A process of producing a fructo-oligosaccharide or fructo-polysaccharide, having  $\beta(2-1)$  linked D-

fructosyl units or having  $\beta(2-6)$  fructosyl units comprising  
combining sucrose and a protein to form a mixture, said protein  
[has] having fructosyltransferase activity, which exhibits at  
least [65%] 85% amino acid identity, as determined by a BLAST  
algorithm, with an amino acid [sequenco ef] sequence of SEQ ID  
No. 1 or 11, [or a part thereof having at least 15 contiguous  
amino acids which are identical to the corresponding part of the  
amino acid sequence of SEQ ID No. 1 or 11,] and

interacting said sucrose with said protein to produce  
said fruco-oligosaccharide or fructo-polysaccharide.